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Pregledni rad

VIRTUAL REALITY EXPERIENCE AND THE VALORISATION OF LOCAL MEDIEVAL HERITAGE: THE TOWN OF CHERVEN AND THE ROCK-HEWN CHURCHES OF IVANOVO

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Abstract: *This paper aims to present the process of constructing a virtual reality experience that delivers a lively image of the heritage of the Middle Ages in the region of Ruse. The paper examines the activities performed by the Rousse Regional Museum of History in 2021–2022 that resulted in the creation of virtual reality products which present the medieval town of Cherven and the rock-hewn churches of Ivanovo (World Heritage Site), located in the Rusenski Lom River valley. The process of creation of these products raises the question of valorisation of the heritage of the Middle Ages in the area, as well as the secondary research phases, related to scientific*

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statements, constructed during more than a century of archaeological research.

Keywords: *heritage, virtual reality, Middle Ages, UNESCO, Cherven, Ivanovo, Bulgaria*

INTRODUCTION

The narratives of the Middle Ages in permanent exhibitions of Bulgarian museums rely mostly on the charisma of original findings – weaponry, adornments, coins, pottery, among others. Since there are few examples of structures preserved in entirety in their original appearance, it is difficult to make a comprehensible presentation of urban and rural environment, monastic life, and specifics of crafts, manufacturing, and commerce. In addition, the classic methodology of constructing a museum narrative relies mainly on texts, photos and plans of the excavated structures, and quite rarely on visual reconstruction.

This paper aims to present the experience of the team of the Rousse Regional Museum of History in constructing a virtual reality (VR) experience for the purposes of presenting the heritage of the Middle Ages in the Ruse region as part of the project *Danube's Archaeological eLandscapes*.

THE VALLEY OF THE RUSENSKI LOM RIVER IN BULGARIA

The Rusenski Lom River in North Bulgaria is the last major right tributary of the Danube. In the Danubian Plain, it forms a branched web and carves picturesque canyons. Rocks are distributed on long rock belts and arches, composed of limestones and marls. The developed karst process has formed a large number of caves. The beneficial climate, the concentration of natural resources and the protection it provides have

been attracting human presence throughout various periods in history (Shkorpil 1914, 5).

Limestone rocks offer the opportunity for the habitation of 902 species of plants. Forests of oak and hornbeam can be found in this area. Diverse birds inhabit the river's surroundings, such as the black stork, the golden eagle, Egyptian and griffon vultures, the rock dove and others. There are 66 mammal species, which include protected bats, otters, jackals, foxes, roes and deer, and wild boars.

Two museum reserves were established for the protection of cultural heritage in 1965 – "Rock-hewn Churches of Ivanovo" and "Medieval Town of Cherven", which were later transformed into National Archaeological Reserves. Together with the "Rusenski Lom" Natural Park, the archaeological reserves form a specific area under protection, where diverse aspects of heritage are presented to various audiences.

MEDIEVAL TOWN OF CHERVEN

The medieval town of Cherven is a National Archaeological Reserve, situated 45 km south of the town of Ruse, Northeast Bulgaria. It is located in the canyon of the Rusenski Lom, on a rocky hill surrounded by the waterway. The first archaeological excavations on the site were conducted in 1910, and have been conducted annually since 1961. Owing to a suitable degree of exploration, Cherven is one of representative examples of urban development during the High Middle Ages in Bulgaria.

The town was established as a fortification by the Byzantine Empire during the early 6th century. At the end of the 12th century, Cherven was among the major centres of the Second Bulgarian Kingdom (12th–14th century). It boasted a robust fortified citadel, a walled town, and unfortified neighbourhoods at the foot of the hill (fig. 1). The seat of the local aristocrat was located at the Castle of Cherven – a large building with five battle towers, inner yard, a church and water supply reservoirs. The

citadel also housed 7 Christian temples, residential buildings, workshops, storage facilities, administrative and military buildings. The west sector of the citadel contained the garrison of Cherven – a series of long two-storey buildings, erected at the back of the west fortification wall. The battle tower of this wall has completely retained its 14th century appearance, and is one of the very few remaining examples of Bulgarian fortification buildings during the High Middle Ages.

Figure 1. Aerial view on the Citadel of the Medieval town of Cherven (photo: Iskren Velikov, Rousse Regional Museum of History)

After 1235, with the restoration of its church, Cherven became the seat of a Bulgarian Orthodox archbishop. The cathedra of the archbishop (Church No 1) is located at the highest point of the rocky hill, within the boundaries of the town proper. This is also the place where the archaeological research of the town began in 1910.

Sources reveal very little about the history and role of Cherven; thus, the reconstruction of its glorious past remains the task of archaeological studies. The peak of the town's development came during the second half of the 14th century, when its estimated population numbered around 10,000 residents. A recent examination of decorative plates of

one of the churches in Cherven has revealed a monogram, which supposedly shows Patriarch Callistus I of Constantinople as a donor for the temple's construction. The town had close relations with the royal capital in Tarnovo and occupied a strategic place along the route between the central authority, the Danube River and the lands beyond.

Following the Ottoman conquest in 1388, Cherven continued to play an administrative and military role, but its development stagnated. As of the end of the 16th century, following a number of raids into its territory and a rapid decline in its population, the town of Ruse replaced Cherven as the centre of that region.

THE IVANOVO ROCK-HEWN CHURCHES

The "St. Archangel Michael" rock-hewn monastery[2] combines six complexes of premises, cut into the rocks of the Rusenski Lom river valley. It was founded during the first half of the 13th century by the monk Yoakim. According to his biography, he and his three disciples were visited by the Bulgarian Tsar Ivan Asen II (1218–1241), who donated funds for the enlargement of the rock-hewn monastery. In 1235 the independence of the Bulgarian Orthodox Church was restored, and Yoakim was elected as the first Patriarch of Tarnovo.

The connections between the Bulgarian royal family and the rock monastery in the village of Ivanovo marked its future development. Patron portraits in the churches of "St. Archangel Michael", "St. Theodore Tyron and St. Theodore Stratelates" and the "Holy Mother of God" display the images of Bulgarian rulers. With the conquest of the Bulgarian state at the end of the 14th century, the rock-hewn monastery started to decay (Yordanov 2009, 16).

[2] The "St. Archangel Michael" rock-hewn monastery includes the entire complex of rock premises, churches and chapels, known under the vernacular name of "Ivanovo Rock-hewn Churches".

The high artistic value of the preserved frescoes earned the rock-hewn churches of Ivanovo a place in the World Heritage Sites of UNESCO.[3]

The frescoes of the church "Holy Mother of God" are best preserved. Impressive paintings from the first half of the 14th century are full of dynamic gestures and tension of the depicted characters. They belong to the Palaeologan style, named after the Palaeologus dynasty, which ruled the Byzantine Empire (fig. 2). The frescoes are distinguished by realistic images, elegance, presence of nude human bodies, rich architectural and natural backgrounds, and a large number of details. The prevalence of scenes related to the life of Early Christian hermits reveals the influence of Hesychasm, whose followers strove toward unity with the Lord through silence and prayer.

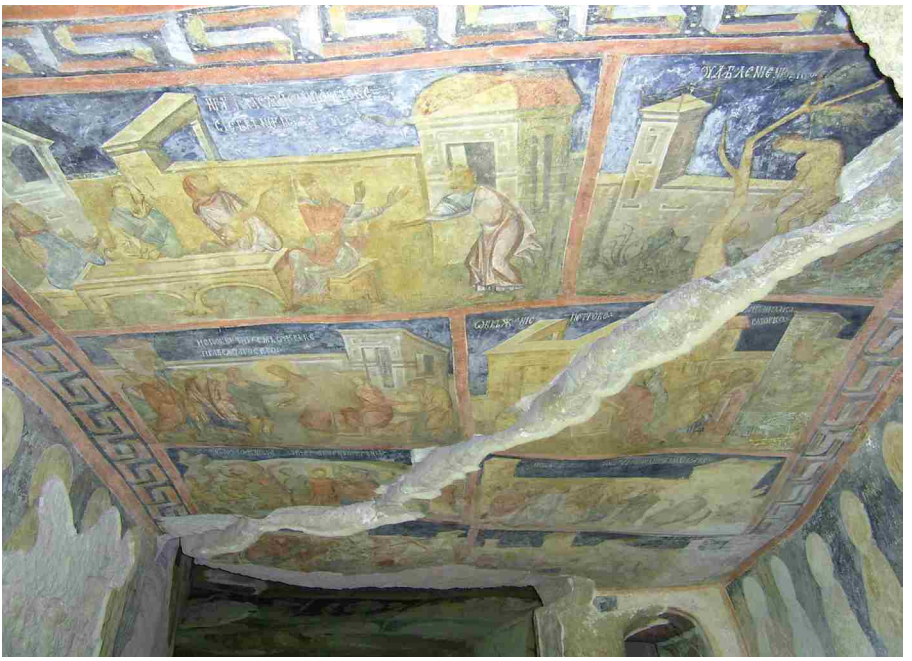

Figure 2. The preserved frescoes on the ceiling of the "Holy Mother of God" rock-hewn church near Ivanovo (photo: Stoyan Yordanov, Rousse Regional Museum of History)

[3] The site was included in the List of World Heritage Sites of UNESCO in 1979, see more at: https://whc.unesco.org/en/list/45/.

The medieval technique of creating frescoes included the plastering of coating over rock, followed by a preliminary drawing with a brush, while the main outlines of figures and their halos were framed with a blade. The paintings are complex and multi-layered, implemented in strong sequence.

THE *DANUBE'S ARCHAEOLOGICAL eLANDSCAPES* PROJECT

The rich and culturally diverse archaeological heritage of the Danube region is the only remnant of the millennia of our society's development and a carrier of important information about our past. Its huge potential for the development of tourism in the region is greatly limited by a lack of visibility, which is required for sustainable management and use. Visibility here refers not only to the sheer physical presence of archaeological artefacts or reconstructions of sites, but also to the visibility of archaeology to the general public. However, new technologies enable us to both visualise archaeological knowledge in completely new ways, and to convey it to the general public promptly and in attractive ways.

The main objective of the *Danube's Archaeological eLandscapes* project is to make archaeological heritage, in particular archaeological landscapes of the Danube region, more visible regionally, nationally and internationally, and thereby more attractive for its integration into sustainable cultural tourism. The backbone of this task are the major regional museums, whose focus extends beyond their own regions, to the most prominent archaeological landscapes of the Danube region. By introducing state-of-the-art virtual reality (VR) and augmented reality (AR) technologies, museums, which are visited by mainstream tourists, will encourage visitors to experience the original appearance of heritage not only from their own country, but also from the countries of other partners.

The project aims not only to support one of the largest networks of major institutions with archaeological collections and knowledge, but also focuses on a long-term cross-promotion campaign for archaeological cultural heritage in the region. The partnership will also continue the work of the RegioStars 2018 finalist Iron-Age-Danube project by promoting the new Iron Age Danube route and creating new transnational archaeological routes as tools for the preservation of this heritage.[4]

The project started on 1 July 2020 and will last for 30 months. The Lead Beneficiary is Universalmuseum Johanneum from Graz, Austria, and partnership organizations come from Austria, Bavaria (Germany), Czechia, Slovakia, Hungary, Slovenia, Croatia, Serbia, Romania and Bulgaria. The project's main outputs, related to the creation and presentation of virtual representations of sites from different historical periods by each of the partners – the so-called Virtual Rooms – were opened in April-May 2022 in the premises of every partner institution.

THE IMPLEMENTATION OF VR RECONSTRUCTIONS

The main *aim and concept* of the work was related to the presentation of a reconstructed image of a large fortified urban settlement and a rock-hewn church from the period of the High Middle Ages (12th-14th century) in Bulgaria. This was a considerable challenge, mainly due to a lack of diverse existing examples.

Most structures from that period in our country are not well-preserved and, while they do offer certain information on planning specifics, the *hypotheses* on the appearance of these structures are based on the material discovered during archaeological excavations. A number of

[4] *Danube's Archaeological eLandscapes* (Virtual Archaeological Landscapes of the Danube region), Interreg Danube Transnational Program. https://www.interreg-danube.eu/approved-projects/danube-s-archaeological-elandscapes (visited on 2 May 2022).

studies related to the medieval town of Cherven have also been done over the past more than 100 years, which offer a sound foundation for the creation of a visual reconstruction in a virtual environment.

The *Castle of Cherven* is the largest visual marker in the silhouette of the medieval town and among the places of great interest to the visitors. It is a massive structure, erected at the highest point of the citadel, covering an area of 2000 square metres. It surrounds an inner yard with a church inside. It functioned as a fortress within the fortress (fig. 3). Throughout the years, many hypotheses about the appearance of the castle have been published, suggesting the number of towers it had, the specifics of its facades, and even questioning its fundamental functions[5]. In order to build a credible image of the castle of Cherven, we looked at the unquestionable features of the remains – the ones that

Figure 3. Visual reconstruction in virtual reality environment of the Castle of Medieval Cherven (copyright: Rousse Regional Museum of History, Tornado Studios)

[5] According to one of the published hypotheses, the castle was in fact a monastery, which was also the seat of the Lord of Cherven – the Archbishop of the Eparchy.

are not subject to dispute. Two of the three wings of the castle had two levels (floors), and the east wing had three floors, being the main one. The ground floor was associated with garrison and economic functions. One of the ground-floor premises was transformed into a cistern for the storage of water (which was proved by archaeological means). The castle numbered five towers, and was only accessible through a single gate. The building was also linked to a fortified water source at the foot of the hill (Dimova, Georgieva, Nesheva, Zaimov, Ivanov, Angelov, Valev 1985, 39).

The *residential area* of the medieval town of Cherven was reconstructed strictly along the lines of the unearthed remains that are certain to have belonged to the relevant period of the High Middle Ages[6]. Since the only physical remains of houses are their stone foundations and the levelled bedrock, their height and appearance have been presumed based on the stratigraphy from the archaeological research of the area. The density of the buildings' foundations reveals a large number of residents; at the same time, there was a high level of commercial activity along the main street. In addition to the stone blocks, there are traces of adobe, bricks and timber, which hints at the likely possibility for the residential buildings to have had a second floor. Based on these studies, the concept of a densely built-up and populated citadel was adopted, particularly along the main street of medieval Cherven, whose width was 1.80 m. The places for commerce and exchange of goods were most likely in open areas – at crossroads and around temples.

The creation of a visual reconstruction of *Christian temples* in medieval Cherven was a relatively easy task, derived from and related to in-depth studies. These structures are not only among the best preserved, but also follow strict regulations related to Christian laws. In addition, in the territory of modern-day Bulgaria there are several examples of

[6] This clarification is required due to the fact that the upper (latest in chronology) layer of Cherven belongs to the 15th–16th century – the Early Ottoman period.

churches from the 13th–14th centuries, preserved in entirety, which share a lot of common features with the remains unearthed in Cherven. One such place is the town of Nesebar on the Black Sea coast, a World Heritage Site, where along with Roman and Late Antiquity remains, there are many examples of preserved religious architecture from the High Middle Ages (Dimova 2008). The churches in medieval Cherven were built mainly of stone blocks in regular shapes, decorated and levelled with brick layers (Velikova, Zhekunova 2021, 152). Their facades had shallow arched niches, outlined with glazed plates with yellow and green colour. Recent examination of a piece of a preserved monogram, depicted on such a decorative glazed plate, relates the name of Patriarch Callistus I of Constantinople as the patron of one of the churches in the citadel of Cherven (Sengalevich 2019, 126). Some of the buildings had bell towers

Figure 4. Visual reconstruction in virtual reality environment of the iconostasis of the "Holy Mother of God" rock-hewn church near Ivanovo (copyright: Rousse Regional Museum of History, Tornado Studios)

integrated into the western section, above the narthex, and all of them were domed above the nave. The altar section of the larger churches had three apses, with a tall and narrow window on the central apse. Their roofs were covered with tiles, with the exception of the most representative temple, which served as a cathedral during the late 14th century, and was covered with lead plates, as was discovered during the excavations.

The advantages posed by the conservativeness of Christian tradition in iconography were of some assistance in the creation of a hypothesis for the presumed interior of the "Holy Mother of God" rock-hewn church near Ivanovo during the 14th century. The preserved frescoes on the ceiling of the temple depict the narrative for the Holy Week and the Passion of the Christ. With this knowledge in hand, specialists in art studies during the past century have made assumptions regarding the sections that were more damaged through the years. This is also of great importance for the visual reconstruction of wall frescoes, where the images of the Fathers of the Christian Church, of the first hermits, and of prophets from the Old Testament can be recognized. In relation to construction, the nests for wooden beams cut into the rock attest to the existence and the location of an altar fence (iconostasis), and of a wooden path constructed outside the rock-hewn church (fig. 4).

With the abovementioned hypotheses in mind, the process of *creation* of the virtual experiences started with the scanning of the physical landscape of the sites – the entire hill of Cherven, as well as the interior and exterior of the "Holy Mother of God" rock-hewn church. The scanning, performed with manual scanners and drones, allowed for the most accurate virtual contextualization of reconstructions. The virtual reconstructions were integrated into a single virtual space, for each of the archaeological sites, using Unreal Engine, which allows for the entirely free and out-of-script behaviour of every user of the virtual reality experience.

VALORISATION OF THE HERITAGE OF THE MIDDLE AGES

In October 2021, after 6 months of conservation and design works, the new permanent exhibitions for the heritage of the Middle Ages in the Ruse region were unveiled at the Rousse Museum of History. The narrative unfolds within two halls and a corridor, and is generally developed along the axis of "secular-spiritual". The medieval town of Cherven occupies an emblematic place in the section, which displays the everyday life in an urban centre in Bulgaria during the Middle Ages. The "St. Archangel Michael" rock-hewn monastery narrates the spiritual life in the same valley, as the zone of contact with secular authorities, with a strong relationship with the medieval capital of Tarnovo.

A part of this update of the permanent exhibition design included the upcoming integration of the virtual reconstructions of both sites. The concept foresaw one virtual corner in each of the two halls in order for the visual interpretation and narrative of the sites to be (even on a physical level) contextualized among the permanent exhibitions – to be located along with the findings and the information provided.

The new design of the permanent exhibitions and the virtual reconstructions of the two sites were only part of the initiatives in 2021, related to the topic of the Heritage of the Middle Ages in the region of Ruse. In June 2021 an International Scientific Conference on the same topic was conducted in Ruse, on the occasion of the 800th anniversary of the foundation of the "St. Archangel Michael" rock-hewn monastery near Ivanovo, and 110 years after the first excavations in the territory of the medieval town of Cherven. Proceedings with articles are forthcoming, and a catalogue of the permanent exhibitions was issued in October 2021. Several months earlier, the last work of Stoyan Yordanov was published – one of the longest active archaeologists on the site of medieval Cherven (Yordanov 2019).

All of these occasions, in addition to the active promotion of the two sites as tourist destinations, brought the topic of medieval heritage in our region to the attention of the local community. As a result, one of the latest donations, and part of the permanent exhibition in the museum, is a small-scale model of the entire citadel of Cherven, created by a non-professional enthusiast, who was inspired by the news and the knowledge from the research conducted by specialists in the field.

CONCLUSION

The use of virtual reality (VR) for delivering interpreted information related to the High Middle Ages in Bulgaria appears to be a successful way of overcoming many difficulties, which otherwise emerge within the framework of a classical museological approach. Responding to the desire of the visitors to deliver an understandable narrative, the virtual reality experience at the Rousse Regional Museum of History also allows an out-of-the-script behaviour of the user, which addresses directly the natural desire for discovery, and therefore – for a sustainable understanding of the topic.

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ISKUSTVO VIRTUELNE STVARNOSTI I VALORIZACIJA LOKALNOG SREDNJOVEKOVNOG NASLEĐA: GRAD ČERVEN I CRKVE ISKLESANE U KAMENU U IVANOVU

Sažetak: *Cilj ovog rada je da predstavi proces kreiranja iskustva virtuelne realnosti koje pruža živopisnu sliku srednjovekovnog nasleđa u regionu Ruse. Predmet ispitivanja su aktivnosti Regionalnog muzeja istorije u Ruseu u periodu 2021–2022, čiji su rezultat proizvodi virtuelne stvarnosti koji predstavljaju srednjovekovni grad Červen i crkve isklesane u kamenu u Ivanovu (mesto svetske baštine), koji se nalaze u dolini reke Rusenski Lom. Proces kreiranja ovih proizvoda dovodi do pitanja kako se valorizuje srednjovekovno nasleđe u ovoj oblasti, kao i pitanja o sekundarnim fazama istraživanja u vezi sa naučnim izjavama iznetim tokom više od jednog veka arheoloških istraživanja.*

Ključne reči: *nasleđe, virtuelna stvarnost, srednji vek, UNESCO, Červen, Ivanovo, Bugarska*